

What is claimed is:

1. Polylactic acid fiber which contains fatty acid bisamide and/or alkyl-substituted fatty acid monoamide in an amount of 0.1 to 5 weight % in relation to the whole of fiber.

2. The polylactic acid fiber according to claim 1, wherein b^* value in fiber color system of $L^*a^*b^*$ is in the range of -1 to 5.

3. The polylactic acid fiber according to claim 1, wherein fatty acid bisamide and alkyl-substituted fatty acid monoamide are 80°C or higher in melting point.

4. The polylactic acid fiber according to claim 1, wherein fiber-constituting polylactic acid is 40 eq/t or less in carboxyl end group amount.

5. The polylactic acid fiber according to claim 1, wherein fiber-constituting polylactic acid is from 50,000 to 500,000 in weight-average molecular weight.

6. The polylactic acid fiber according to claim 1, of which the strength is 2.0cN/dtex or higher.

7. The polylactic acid fiber according to claim 1, of which the elongation is in the range of 15 to 70%.

8. The polylactic acid fiber according to claim 1, of which the boiling-water shrinkage rate is in the range of 0 to 20%.

9. The polylactic acid fiber according to claim 1, of which fiber-constituting component has an exothermic peak of crystallization in a temperature decrease at 100°C or higher.

10. The polylactic acid fiber according to claim 1, which has a form of filament.

11. The polylactic acid fiber according to claim 10, wherein said filament is 1.5% or less in thickness unevenness of U%.

12. The polylactic acid fiber according to claim 10, which is not treated by crimping and has on the surface thereof at least one type of smoothing agent selected from fatty acid ester, polyvalent alcohol ester, ether ester, silicone and mineral oil.

13. The polylactic acid fiber according to claim 10, which has crimps made by fluid texturing.

14. The polylactic acid fiber according to claim 13, which has on the surface thereof at least one type of smoothing agent selected from fatty acid

ester, polyvalent alcohol ester, ether ester, silicone and mineral oil.

15. The polylactic acid fiber according to claim 13, having the following properties:

crimping elongation rate: 3 to 35%

single fiber fineness: 3 to 35dtex

degree of modified cross section: 1.1 to 8

16. The polylactic acid fiber according to claim 10, which has crimps made by false twist texturing.

17. The polylactic acid fiber according to claim 16, which has on the surface thereof a smoothing agent mainly constituted with polyether.

18. The polylactic acid fiber according to claim 17, wherein said polyether is a compound or a derivative thereof in which alkylene oxide with the carbon number of 2 to 4 is added through copolymerization to alcohol having one or more of hydroxyl groups within molecule.

19. The polylactic acid fiber according to claim 16, having the following properties;

strength at 90°C $\geq 0.4\text{cN/dtex}$,

CR $\geq 10\%$,

non-untwisted number ≤ 3 pieces/10m

20. The polylactic acid fiber according to claim 19, wherein the boiling-water shrinkage rate is 15% or lower.

21. The polylactic acid fiber according to claim 1, which has a form of staple fiber.

22. The polylactic acid fiber according to claim 21, which has on the surface thereof at least one type of smoothing agent selected from fatty acid ester, polyvalent alcohol ester, ether ester, silicone and mineral oil.

23. The polylactic acid fiber according to claim 21, having the following properties;

crimp number ≥ 6 /25mm,

crimping rate $\geq 10\%$.

24. A yarn package wherein the filament according to claim 10 is wound.

25. The yarn package according to claim 24, wherein the saddle of the package is 7mm or lower.

26. A fiber product in which the polylactic acid fiber described in claim 1 is used at least partially.

27. The fiber product according to claim 26, in which the fiber product is a knitting fabric.

28. The fiber product according to claim 26, in which the fiber product is a woven fabric.

29. The fiber product according to claim 26, in which the fiber product is a nonwoven fabric.

30. The fiber product according to claim 26, in which the fiber product is a carpet.

31. The fiber product according to claim 26, wherein the solidity to dry friction is third grade or higher and the solidity to wet friction is second grade or higher.